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ABSTRACT

A preliminary study was conducted at which the "Test for Economic Understanding" was given to 98 Anglo and 35 Mexican American freshmen and sophomore students at New Mexico State University at the beginning and end of the 1971 fall semester. The following questions guided the investigation: (1) Is there a significant difference between Mexican American students and Anglo students in terms of their understanding of basic economics at the onset of a principles course in economics? (2) Is there a significant difference between Mexican American students and Anglo students in terms of their understanding of basic economics at the end of the same course? (3) Is there a significant difference in the relative gain in economic understanding between the two groups? The findings indicated that the significant difference in economic literacy which existed between Anglo and Mexican American students at the beginning of an introductory course in economics appeared to be eliminated upon completion of the course. In the expanded study currently under investigation, the sample size has been increased from 133 to 216 Anglo and Mexican American students. The primary interest of the current investigation is to determine what, if any, factors other than ethnicity, are related to changes in economic understanding. The analytical tool to be utilized in treating the data involves computing in sequence multiple linear regressions equations. (HBC)

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A PRELIMINARY ANALYSIS OF ECONOMIC UNDERSTANDING AMONG TWO ETHNIC GROUPS IN THE SOUTHWEST

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Presented at

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CENTER FOR BUSINESS SERVICES

OCCASIONAL PAPER NO. 209

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Introduction

To the sensitive student of American society, one of the most significant aspects of the 1960's was the emergence of explicit demands by minority groups for equal treatment in regard to jobs, housing, education, and social justice in general. These demands were undoubtedly justified and, in fact, overdue.

One avenue of approach to social and economic justice for minority groups is to insure quality education to a point of parity with their white (for the purposes herein, Anglo) bretheren. The efficacy of this approach depends, in part, on whether or not the current educational system is attuned to the needs of minority groups. If it is not, then some alternative pedagogical arrangements must be made.

Recently we at New Mexico State University undertook a study to determine if our existing educational structure is having a differential learning effect on the Anglo majority and a minority group--in this instance, Mexican Americans.

Of particular interest in the study was the extent of economic literacy acquired by these two groups. One reason this area was chosen is because a basic

understanding of economics provides a basis for functioning in a wide range of endeavors. Calderwood has stated:

> As citizens in a democratic society, all persons have to make decisions on a wide variety of economic problems of local, state and national and international significance, and then express their views in the voting booth. These problems range all the way from voting on a school bond issue to making up one's mind about foreign aid, farm price supports, or labor-management relations. Some knowledge of economics is essential if these decisions are to be made intelligently. In this respect, economic understanding is part of the basic fabric of a democratic society.[1]

Another reason the subject of economics was chosen for analysis is grounded in the lower participation of Mexican Americans in the economic system. Lower skill levels, discrimination, and lower education levels lead to lower incomes which restrict participation in what is for most of us an economy of plenty. If the workings of the economy is understood less by Mexican Americans than Anglos, educational institutions might then focus on this problem in hopes that improved understanding will lead to improved participation in the economic system.

The Preliminary Study

In an attempt to evaluate the impact of economic courses on both of these groups, the authors posed the following questions as guides for the preliminary investigation:

1. Is there a significant difference between Mexican-American students and Anglo students in terms of their understanding of basic economics at the onset of a principles course in economics?

2. Is there a significant differenee between Mexican-American students and Anglo students in terms of their understanding of basic economics at the end of the same course?

3. Is there a significant difference in the relative gain in economic understanding between the two groups? Put another way, do Anglos or Mexican Americans learn more economics in the same course on a relative basis?

The instrument which was used for measuring the performance of Anglos and Mexican Americans was the Test for Economic Understanding,[2] Form B, which is comprised of 50 multiple choice questions. This particular test was chosen for the following reasons: First, it is a nationally standardized test which has been used extensively to measure student performance in high school economics classes. Second, it has served as an effective instrument in measuring the economic understanding of elementary and secondary school teachers participating in various in-service economics classes and economic education institutes

throughout the United States. Our sample of college freshmen and sophomores falls somewhere between these two groups. (Although another measuring instrument, the College Test of Economic Understanding, is available, it is designed to measure the performance of students in a more advanced course than the introductory course taught at New Mexico State University.)

The Sample

The Test for Economic Understanding was given to 133 Anglo and Mexican-American freshmen and sophomore students at NMSU at the beginning and end of the 1971 fall semester. There were 98 Anglo students and 35 Mexican-American students in the test group. Those students with Spanish surnames were categorized as Mexican Americans. All of the remaining students were classified as Anglos after having removed one Black student and two foreign students from the sample. All the students were enrolled in "Introduction to Economics," a three-hour, one-semester course covering fundamental economic relationships.

Two of the authors taught two sections of the course from which the test subjects were chosen. Identical textbooks were assigned to the sections, which were similar in ethnic composition and number of students. Course content and level of training of

the instructors were also similar for both sections. Because different instructors shared in the teaching of the 133 students, a possible control problem arose in that differences in economic understanding could be a product of the teacher's performance in the classroom. To eliminate this apparent weakness, the average post test scores for the students in both classes were compared statistically and not found to be significantly different. In other words, the level of economic understanding that both classes had achieved at the end of the semester were virtually the same. If they had been significantly different from one another, the teacher difference would have posed a serious bias.

Still another factor considered in the preliminary study was the level of educational attainment of our students. We concentrated on the first and second year student, and we did so for two reasons. First, most freshmen and sophomore students are not much older than the high school samples upon which the test instrument was constructed. Second, if either the Anglo or the Mexican-American students were found to be deficient in economic understanding, hopefully some type of remediation could be provided early in their college career.

Findings

As can be seen in Table 1, the average pre and post scores for both groups were analyzed by a t test between means. The two groups differed significantly in terms of their pre-test scores. The average score for the group of Anglo students was 3.3 points higher than for the group of Mexican-American students. However, the difference in post-test scores, 2.3 points, was less than the difference in the initial test scores and was not found to be statistically significant.

Hence, the preliminary study indicated that the significant difference in economic literacy which existed between Anglo and Mexican-American students at the beginning of an introductory course in economics appeared to be eliminated upon completion of the course. It appears that the Mexican-American students

TABLE 1

THE PRE AND POST TEST SCORES* AND THE DIFFERENCES IN PERFORMANCE FOR ANGLO AND MEXICAN-AMERICAN STUDENTS

	Anglo (n = 98)	Mexican American (n = 35)	Differences
Average Pre-Test Score	27.2	23.9	3.3**
Average Post-Test Score	31.7	29.4	2.3

*Scores indicate the number of correct responses on a fifty question test. **Significant at the .05 level.

learned more economics than the Anglo student and were therefore able to narrow the distance which appeared at the beginning of the course.

We were not only interested in comparing the two ethnic groups with each other but also were concerned with whether or not the pre/post change for each group was of an important magnitude. To answer this question, a statistical test of mean differences was made for both groups. The analysis revealed that both groups actually did experience a significant increase in their understanding of economics during the pre/post period, with the group of Mexican-American students experiencing the large gain. The calculated t values were 5.97 and 8.33 for Anglos and Mexican Americans, respectively. Both values were statistically significant at the .001 level.

Although the preliminary findings were interesting, the authors recognized that they were quite tentative--if not tenuous because we did not deal with a number of factors other than ethnicity which often affect educational achievement. Therefore, in the spring semester of 1972, we have embarked upon an expanded study. This study has two principal objectives. First, we want to determine if the preliminary findings can be duplicated utilizing an enlarged sample.

Second, we want to determine if the differences in the preliminary study associated with ethnic classification can be "explained away" by incorporating a variety of other variables into the study. Said more simply, we felt that factors other than ethnic background are more likely to "explain" the variation in economic understanding. Ethnicity may be related but we feel on a priori grounds, along with other writers,[3] that its associative contribution to the variation in changes in economic understanding is small.

THE EXPANDED STUDY

The Sample

In the expanded study currently under investigation, the sample size has been increased from 133 in the preliminary study to 216 Anglo and Mexican-American students. All are either freshmen or sophomores enrolled in two sections of "Introduction to Economics" for the 1972 spring semester at New Mexico State University. Each section again is being taught by a different instructor--a control problem which will be discussed along with the analytical technique for testing the data. Of the 216 students, 170 are classified as Anglos and 46 are deemed as Mexican-Americans. Classification for this study, similar to the earlier study, is based on surnames.

The Test for Economic Understanding was administered to this sample during the first week of the spring, 1972 semester. No formal instruction had begun prior to the administration of the instrument. The post-test will be given during the last week of the same semester.

Pre Test Findings

Similar to the analysis of the first study, a t test between the mean pre-test scores of both ethnic groups was made to establish similarities between the initial smaller sample and the current one. Establishing

similarities is not necessarily crucial for the study but we are interested in discovering parallels in pre-test scores for the purpose of buttressing our expectations for the post-test.

Similar to the pre-test findings in the earlier study, the average pre-test score for Anglos was 27.8 compared with 27.2 in the earlier study. The pre-test for Mexican Americans revealed a score of 24.8 as compared with 23.9 in the preliminary study. The difference between the means of the two groups in the expanded study is 3.0 as compared with 3.3 in the earlier study. Based on these similarities in the pre-test findings of the two samples, we anticipate the post-test results of the enlarged study to parallel approximately the post-test findings of the earlier study.

However, the question of whether or not Mexican-American students are able to close the "knowledge gap" in economic understanding is only one point of concern in this effort. The primary interest of the current investigation is to determine what, if any, factors, other than ethnicity, are related to changes in economic understanding. The issue in a broader sense is basically the age old question of nature vs. nurture: are behavior differences a product of traits indigenous to a particular racial group or are the differences a product of the

myriad environmental factors impinging on the person(s) exhibiting the behavior?

In our own society, the question becomes: is variation in economic understanding a function of ethnic background or is it a function of many other factors which comprise ethnic background? It is known, for example, that children from parents in professional occupations display different academic behavior than do children whose parents are engaged in menial work activities. Furthermore, we also know that there are proportionally more Anglo parents in professional occupations than Mexican-American parents. This one factor alone could be associated with differences in the academic performance of the two groups. And there are undoubtedly many other environmental factors that do not affect both groups equally.

The Variables

We are interested in identifying those factors other than ethnicity that account for the variation in differences in economic understanding. We will employ a multiple regression analysis on the data which have been gathered. The dependent variable (Y) will be the difference between the pre and post test scores for all the students in our selected sample.

There are many independent variables of interest for this study, the majority of which are related to personal characteristics of each student and could conceivably influence his performance on the Test for Economic Understanding. For example, the occupational and educational levels of the student's parents will influence his overall educational achievement. Gallant[4] found that students whose parents' jobs were classified "professional" had higher mean G.P.A.'s than did students whose parents were employed as "service' workers and "manual" laborers. However, other writers have found the obverse to be true. Harris[5] and Gurton[6] found family social status and high socioeconomic levels (both are largely associated with occupational categories) to be related to lower academic performance among their children while children from low socioeconomic status and low parent occupation categories performed higher.

We have included the size of the student's graduating class also even though the literature offers no strong support for doing so. Staton[7], Guyton[8], and Gallant[9] found the size of class not to be related to high school graduating ACT performance or class grades. Nevertheless, for exploratory purposes we wanted to include it.

In reference to sex, Staton[10] reported female students to be more likely to be successful academically

when high school G.P.A.'s, occupation of parents, and size of high school were held constant. Women also performed better than men in ACT English according to a study by Friesen.[11] However, male students were reported in the same study as performing better than females on the ACT math and nature sciences portions.

We felt that the number of hours worked in a paying job per week might have something to do with a student's clsssroom performance. Some of our students at NMSU are dependent largely on their personal efforts for economic support while in school. It is not uncommon, therefore, to have students working as many as forty hours while carrying a 12-15 hours course load. A priori, a situation of this type is certain to affect academic performance.

Finally, we have included a standard measure of general academic achievement--the four component scores and the composite score on the ACT. This test is given before or early in the first year of college life. For our purposes, we expect this variable to be highly related to gains achieved in economic understanding. We are suspicious, however, that the ACT may harbor ethnic biases. This is something we will have to investigate before the final study is complete.

For a complete listing of all the variables which are to be included in our expanded study, see Appendix A. The instrument used to collect all of these variables with the exception of ACT and economic understanding scores appears in Appendix B.

Analytical Technique

Because this study involves discrete (such as father's occupation) as well as continuous variables, an analytical question is posed if it is desirable to include both types of variables in a singular parametric analysis. However, recent developments in statistics provide a way around the problem. By "dummying" the discrete variable, they can be included along with continuous variables in a parametric analysis (Suits,[12] Cohen,[13] and Lane.[14])

This technique is relatively simple yet it provides a powerful tool for social scientists as they frequently encounter many variables of a discrete nature. The mechanics of the technique are as follows: in our own study, ethnicity is "dummied" by scoring a 0 if the subject is an Anglo and a 1 if Mexican American. Similarly, if the same subject is a female, a score of 0 is registered, if the student is a male, a score of 1 is given. The same procedure applies to the occupational category of the subject's father. If the

father is in a professional occupation, a 1 will be registered with zeroes for all the remaining occupational categories. Discrete variables handled in this way, then, may be regressed, along with continuous variables such as age, against the criterion variable.

The analytical tool employed to treat the data is a step-wise multiple regression technique which is readily available in program form.[15] It involves computing in sequence multiple linear regression equations. In the first step of the calculations, the independent variable chosen for entry into the equation is the one which makes the greatest reduction in the error sum of squares. In the second step, the second most influential variable was entered and so on until all influential variables are included. In short, a subset of all the available variables will be chosen by this technique. Those variables not found to make a significant contribution to the variation in the criterion variable will simply not be included in the equation. It is through the use of the technique described above, that we hope to be able to isolate those variables whether they be discrete or continuous which will more satisfactorily explain the variation in the criterion variable.

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Summary

This paper is concerned with the degree to which achievement in economic understanding is a function of the ethnic background of the students. Mexican-American and Anglo categories were of interest here. In the pilot study, statistical analyses revealed a significant difference in the pre-test scores on the Test of Economic Understanding. The Anglo students scored higher than their Mexican-American classmates. However, upon completion of the course, the Mexican-American students closed the gap considerably--to a point at which the two average pre-test scores were no longer significantly different.

During the spring semester of 1972, an expanded study has been undertaken to validate the earlier study and to try and identify those variables other than ethnicity that are associated with changes in economic understanding. The variable of ethnicity is said to be nothing more than a farrago of other factors external to the individual. Factors such as socioeconomic background, credit hour load, hours working outside of school are examined.

The variables in the expanded study are: the criterion will be the net difference between the pre and post scores on the Test of Economic Understanding,

the independent variables are sex, age, ethnicity, parent's occupation, parent's education, course grade, ACT scores, credit hour load, size of high school graduating class, course instructor, and G.P.A. at the end of the semester.

The data will be analyzed through the use of a step-wise multiple regression technique which allows for the handling of discrete as well as continuous variables. The end result of this technique is a predictive equation which will contain only those independent variables that are associated with variation in the criterion.

FOOTNOTES

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APPENDIX A

THE VARIABLES

Dependent Variable	Discrete or Continuous
Difference between the pre and post scores obtained on the Test of Economic Understanding	C
Independent Variables	
1. Student Ethnic Background	D
2. Student Age	C
3. Student Sex	D
4. Father's Education Level	D
5. Mother's Education Level	D
6. Size of High School Graduating Class	C
7. Father's Occupation	D
8. Mother's Occupation	D
9. Number of Hours Per Week Employed by the Student	D
10. Final Grade in Course	D
11. Course Instructor	D
12. Total Number of Credit Hours Carrying During the Spring, 1972 Semester	D
13. ACT English	C
14. ACT Math	C
15. ACT Social Studies	C
16. ACT Natural Science	C
17. ACT Composite Score	C
18. Student's GPA at End of Spring, 1972	

APPENDIX B

DATA SHEET

Your answers to the following questions play an important role in this research project. Please answer each question as accurately as possible.

Name_____

Age_____

Sex: (check one)_____M _____F

Father's Occupation_____

Mother's Occupation_____

Father's Highest Level of Educational Attainment (check one)

College Graduate	_____
Some College	_____
High School Graduate	_____
Some High School	_____
Grade School Only	_____

Mother's Highest Level of Educational Attainment (check one)

College Graduate	_____
Some College	_____
High School Graduate	_____
Some High School	_____
Grade School Only	_____

What was the approximate size of your high school graduating class?

_____number of students graduated

Name of High School_____

Location of High School_____
City State

How many hours per week are you employed? Answer with 0 if you are not currently employed.

_____hours

How many credit hours are you carrying in school this semester?

_____credit hours

You were one of how many children in your family?

_____children